

Commercial Substations

City of Seattle Response to Request for Information Regarding the Harbor Island Superfund Site, East Waterway Operating Unit

D. QUESTIONS

1. Identification and Association with Subject Property

- a. Provide the full legal name and mailing address of Respondent.

City of Seattle
c/o William Devereaux
Director, Environmental Management and Real Estate Division
Seattle City Light
700 5th Avenue, Suite 3316
P.O. Box 34023
Seattle, Washington 98124-4023

- b. For each person answering these questions on behalf of Respondent, provide that person's:
- i. full name;
 - ii. title;
 - iii. business address and electronic mail address; and
 - iv. business telephone number.

Jo Bruskotter
Senior Paralegal, Environmental Section
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701 Fifth Avenue, Suite 2050
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206-233-2152

- c. If Respondent wishes to designate an individual for receiving future correspondence from the EPA concerning the EWOU, please indicate so here by providing that individual's name, mailing address, electronic mail address, telephone number, and fax number.

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- d. Provide the address of each Subject Property, the time period when Respondent held any ownership or other interest in the Subject Property, and the type of interest held.

The responses in this narrative address the City's former and current commercial substations within the geographic area of interest covered by the EWOU 104(e) Request for Information to the City of Seattle. Commercial substations, sometimes called industrial or customer substations, provide power to a specific customer and are installed at the customer's request.¹

Seattle City Light (SCL) owns some of the electrical equipment operated at commercial substations but does not own or lease the property on which the substations are situated.² Commercial substations are located on the customer's property and are identified by the customer's address or facility name.

Most of the substations identified for this response are no longer in operation, and operation dates are estimated from available SCL Power System Reports.³ The commercial substations in the EWOU area are:

Ash Grove Cement (formerly Lone Star Cement), located at 3801 E Marginal Way South. The substation has operated from approximately 1962 to the present.⁴

Boeing Yard A, formerly located at 2400 11th Avenue Southwest. The substation operated from at least 1960 to at least 1969.⁵

Burlington Northern, formerly at 3rd Avenue South & South Holgate. The substation has operated from at least 1982 to at least 2004.⁶

Cudahy Foods, formerly at 2203 Airport Way South. The substation operated from at least 1982 to at least 1998.⁷

¹ Pers. Comm. w/ E. Richards, 2/25/2015; Pers. Comm. w/L. Hammack and M. Juntilla, 3/1/2016.

² Pers. Comm. w/ P. Schroeder, 7/24/201; Pers. Comm. w/L. Hammack and M. Juntilla, 3/1/2016.

³ Current power system information is confidential, so the City is providing reports and system information through 2004.

⁴ SEA713207, at SEA713239 (33), 1962 Power System Information report; SEA EWW_00009037, at SEA EWW_00009132 (96), 2004 Power System Engineering Information report.

⁵ SEA EWW_00008676, at SEA EWW_00008710 (35), 1960 Power System Information report; SEA EWW_00008945, at SEA EWW_00009013 (69), 1969 Power System Information report.

⁶ SEA713673, at SEA713728 (56), 1982 Power System Information report; SEA EWW_00009037, at SEA EWW_00009132 (96), 2004 Power System Engineering Information report.

⁷ SEA713673, at SEA713729 (57), 1982 Power System Information report; SEA713812, at SEA713865 (54), 1998 Power System Information report.

Fisher Flour Mill/Pendleton Flour Mills, Fisher Mill was at roughly 16th Avenue Southwest & Southwest Lander Street. The substation operated from at least 1956 to at least 2004.⁸ The mill was closed in 2002.⁹

Lockheed Plant 1/Puget Sound Bridge & Dredge, formerly at 2929 16th Avenue Southwest. The substation operated from at least 1960 to at least 1998.¹⁰

Port of Seattle Terminal 18, at 1050 Southwest Spokane Street. The substation was first listed in SCL's power system reports in 2004, however, City personnel state that a power transformer was installed at Terminal 18 in 1995.¹¹ Terminal 18 is still operating.

Todd Shipyards (now Vigor Shipyards), at 1801 16th Avenue Southwest. The substation operated from at least 1960 to at least 1998.¹² Equipment records indicate that the substation is currently operating.¹³

Western Steel Casting (West Coast Steel Casting), formerly at 145 South Horton Street. Western Steel closed in 2002.¹⁴ City records show that the substation operated from at least 1962 to at least 1998.¹⁵

- e. Identify all materials used or created by Respondent's activities or operations at each Subject Property.

No materials are created at the City's commercial substations. Oil encased in electrical equipment is the principal material in use at the substation sites. Materials are discussed in the responses to 1.h, 1.l and 1.m.

- f. Provide copies of all documents regarding the ownership or environmental conditions of the Subject Property, including, but not limited to, deeds, sales contracts, leases, surveys, investigations, sampling, reports, blueprints, "as-builts," and photographs.

⁸ SEA713195, at SEA713203 (8), 1956 Power System Information report; SEA EWW_00009037, at SEA EWW_00009133 (97), 2004 Power System Information report.

⁹ See <https://www.seattlepi.com/seattlenews/slideshow/Ghost-Towns-of-Washington-Fisher-Flour-Mill-87954.php>

¹⁰ SEA EWW_00008676, at SEA EWW_00008713 (38), 1960 Power System Information report; SEA713812, at SEA713866 (55), 1998 Power System Information report.

¹¹ SEA EWW_00009037, at SEA EWW_00009134 (98), 2004 Power System Engineering Information report; Pers. Comm. with E. Tremaglio, 3/17/2022.

¹² SEA EWW_00008676, at SEA EWW_00008713 (38), 1960 Power System Information report; SEA713812, at SEA713867 (56), 1998 Power System Information report.

¹³ SEA EWW_00010248-all, Todd Shipyard equipment list, 2022.

¹⁴ See <https://www.bizjournals.com/seattle/stories/2002/11/11/story4.html>

¹⁵ SEA713207, at SEA713242 (36), 1962 Power System Information report; SEA713812, at SEA713867 (56), 1998 Power System Information report.

Responsive documents have been produced and indexed.

- g. Provide information on the condition of the Subject Property when purchased or at the beginning of the relevant time period; describe the source, volume, and content of any fill used during the construction of the buildings, including waterside structures such as seawalls, wharves, docks, or marine ways.

Commercial substations are built on the customer's property, and the City has no records describing the condition of the sites on which they are located. Typically, the customer is responsible for constructing the substation foundation.¹⁶

The Boeing Yard A, Fisher Flour Mill, Lockheed/Puget Sound Bridge and Dredge, Terminal 18, and Todd Shipyards substations are or were located on Harbor Island, which was constructed with fill from sluicing Beacon Hill and from Duwamish River dredge spoils. Western Steel Casting was located on former tide flats.

No waterside structures are associated with any of the substations.

- h. Describe the activities or operations at each Subject Property including:
 - i. the date such activities or operations commenced and concluded; and

See the response to h.ii.

- ii. the types of activities or operations performed at each Subject Property, including but not limited to the use, storage, or disposal of any materials in an outdoor location.

Commercial substations distribute power to dedicated customers. Power service and equipment supplied by Seattle City Light vary by customer, but the substations generally consist of one or two transformers and associated equipment. The City owns the transformers, usually owns the switchgear, and sometimes owns the cables at the substations, while the customer owns the breakers and any other equipment.¹⁷ Some switchgear at the Fisher Flour Mill and Ash Grove/Lone Star Cement substations was provided by the customer.¹⁸ Commercial substations usually do not have capacitors, and none of the substations covered by this response were known to have capacitors. Identified SCL equipment at each substation is listed in the response to 1.i. and the attached spreadsheet (*Commercial Substations – Power System Information*).

¹⁶ Pers. Comm. w/E. Richards, 2/25/2015; SEA EWW_00020067-all, SCL pad construction guidelines, 2006; SEA792028, at SEA792029 (2), Todd service agreement, 2003.

¹⁷ Pers. Comm. with P. Schroeder, 7/24/2015; SEA792028-all, Todd service agreement, 2003.

¹⁸ SEA761434, at SEA761438 (5), Ash Grove substation plans, 1967-2009; SEA EWW_00010217, Pendleton Flour Mills maintenance report, est. 2001.

Equipment usually is installed outside on concrete pads that are surrounded by a concrete berm and a fence.¹⁹ The demarcation between SCL equipment and customer equipment, which is called the point of termination, varies among substations according to the service agreed between the City and the customer.²⁰ SCL is responsible for maintaining equipment on its side of the point of termination, and the customer is responsible for equipment and site maintenance on the customer side of the point of termination.²¹

SCL performs visual inspections of commercial substation once per year.²² Historical inspection records are not routinely retained by the City, but a few examples of inspection reports have been located and are provided with the City's documents.²³ Maintenance at commercial substations is minimal but may entail work such as cleaning, lubricating, and painting equipment, checking oil levels, troubleshooting, and testing equipment oil for gases.²⁴ Transformers do not need regular or frequent repairs or maintenance.²⁵ Periodically, oil in transformers may have been filtered to remove impurities that accumulated over time.²⁶ The oil normally was filtered on site using trucks equipped for that purpose.²⁷ Occasionally, transformers at commercial substations have been removed or replaced.²⁸

- i. Describe each release of materials at or from a Subject Property, including the type and quantity of the materials, the location of the release, the impacted media, and the response.

Available records denote two equipment leaks at the Ash Grove substation: a transformer leak that was repaired in 1991 and leakage from secondary bushings in 2002.²⁹

The City has no documentation of releases from any substation reaching a storm sewer or any body of water.

¹⁹ Pers. Comm. w/E. Richards, 2/25/2015; SEA EWW_00020067-all, SCL pad construction guidelines, 2006; SEA EWW_00009877, photo of Ash Gove Cement substation, 2009.

²⁰ Pers. Comm. w/L. Hammack and M. Juntilla, 3/1/2016; SEA792028, at SEA792029 (2), Todd service agreement, 2003.

²¹ Pers. Comm. w/L. Hammack and M. Juntilla, 3/1/2016; SEA761417, at SEA761426 (10), Ash Grove work order, 2009.

²² Pers. Comm. w/P. Schroeder, 7/24/2015.

²³ Pers. Comm. w/D. Williams, 9/29/2015; SEA EWW_00020059, Lone Star inspection report, 1983; SEA761443, at SEA761465 (23), Ash Grove inspection report, 2012.

²⁴ Pers. Comm. w/E. Richards, 4/12/2016; SEA EWW_00010217, Pendleton Flour Mills maintenance report, est. 2001.

²⁵ Pers. Comm. w/E. Richards 12/9/2014.

²⁶ SEA EWW_00024194, at SEA EWW_00024222-224, (29-31), A. Cuplin deposition testimony, 2008.

²⁷ SEA EWW_00024194, at SEA EWW_00024222-224, (29-31), A. Cuplin deposition testimony, 2008.

²⁸ SEA761417-all, Ash Grove work order, 2009.

²⁹ SEA761443, at SEA761446 (4), Ash Grove maintenance records, 1991; SEA761958, at SEA761958 (1), Correspondence re Ash Grove maintenance, 2002.

- j. Provide information on past dredging or future planned dredging in the EWOU.

The City did not dredge or arrange to have dredged any part of the East Waterway in association with the commercial substations.

- k. Provide all documents pertaining to the use, storage, or disposal of any hazardous substances, pollutants, or contaminants at the Subject Property.

Responsive documents have been produced and indexed.

- l. Provide all information on electrical equipment used at the Subject Property, including transformers or other electrical equipment that may have contained polychlorinated biphenyls (PCBs).

Available reports and records list SCL transformers owned at commercial substations, but generally the City did not retain records of other equipment. The attached spreadsheet, *Commercial Substations – Power System Information*, provides equipment information pulled from historic SCL Power System Information reports for all substations addressed in this response. Additional information is provided below. The City found no equipment or testing information for the Boeing Yard A or Burlington Northern substations other than that listed in the spreadsheet.

Ash Grove Cement (formerly Lone Star)

Equipment database records show one power transformer that was removed in 2009 and three power transformers currently at the substation. All equipment contains mineral oil, and test results for three of the transformers show no PCBs.³⁰ When tested in 1987, oil in the removed transformer contained 2.5 ppm PCBs.³¹ Testing in 2000 returned 0 PCBs in that transformer.³²

Cudahy Foods

A 1981 memo reports that Cudahy rented “several” transformers from SCL.³³ The PCB content of those transformers was unknown when the memo was written, but the City has no records indicating testing proposed in the memo revealed PCBs. The memo states that Cudahy owned one transformer that was “PCB filled.”³⁴

Fisher Flour Mill

Equipment database records show one power transformer removed from the substation in 2001.³⁵ The PCB content and type of oil are not recorded.

Lockheed Plant 1

A 1990 equipment printout lists one transformer at Lockheed containing < 1 ppm PCBs.

³⁰ SEA EWW_00009838-all, Ash Grove equipment list, 2022.

³¹ SEA EWW_00024332, Ash Grove equipment P949, nd.

³² SEA EWW_00024332, Ash Grove equipment P949, nd.

³³ SEA EWW_00024333, Memo re potential PCB exposure at food processors, 1981.

³⁴ SEA EWW_00024333, Memo re potential PCB exposure at food processors, 1981.

³⁵ SEA EWW_00010215, Fisher Flour Mill equipment list, 2022.

Port of Seattle Terminal 18

A power transformer installed in 1995 contains mineral oil with < 1 ppm PCBs.³⁶

Todd Shipyards

Equipment database records show seven submersible transformers currently or formerly at the substation, all containing mineral oil.³⁷ Test results for one of the transformers show that it contained 19 ppm PCBs in 1987.³⁸ The remaining transformers contained no PCBs.³⁹ A 1990 equipment printout lists PCB test results for seven submersible transformers at Todd Shipyards. Six transformers contained < 1 ppm PCBs, and one contained 24 ppm PCBs.⁴⁰

An undated switchgear matrix indicates that power transformers were also in use at the Todd Shipyards substation.⁴¹

Western Steel Casting: equipment database records list a submersible transformer containing non-PCB mineral oil at the former substation.⁴² Historical records show that a power transformer was sold to and installed at Western Steel in 1982 and removed in 2002.⁴³ The records do not include PCB testing information.

- m. Provide information on the type(s) of oils or fluids used for lubrication of machinery or other industrial purposes, and any other chemicals or products which are or may contain hazardous substances, pollutants, or contaminants which are or were used at the Subject Property.

SCL transformers at commercial substations used mineral insulating oil, and the oil was contained within electrical equipment. See the response to 1.I for additional information on oil used in some SCL transformers.

Paint may be used by SCL occasionally to maintain equipment.⁴⁴

- n. Provide any Subject Property drainage descriptions plans or maps that include information about storm drainage which includes, but is not limited to, above or below surface piping, ditches, catch basins, manholes, and treatment/detention or related structures including outfalls. If available, also include information about connections to each sanitary sewer.

³⁶ Pers. Comm. w/E. Tremaglio, 3/17/2022.

³⁷ SEA EWW_00010248-all, Todd Shipyard equipment list, 2022.

³⁸ SEA EWW_00010248, at SEA EWW_00010248 (1), Todd Shipyard equipment list, 2022

³⁹ SEA EWW_00010248-all, Todd Shipyard equipment list, 2022

⁴⁰ SEA053631, at SEA053646, 651, 652, 657, 658, 662 (16, 21, 22, 27, 28, 32), transformer PCB information list, 1990.

⁴¹ SEA EWW_00010253, Todd switchgear labels, nd.

⁴² SEA EWW_00010254, Western Steel equipment list, 2022.

⁴³ SEA EWW_00024338, at SEA EWW_00024338, 342 (1, 5), Western Steel power transformer record, nd.

⁴⁴ Pers. Comm. w/E. Richards, 4/12/2016.

Drainage systems at commercial substation sites are the responsibility of the customer, and the City typically does not have information about the drainage infrastructure.⁴⁵ The City has no information on engineered drainage related to the commercial substations addressed in this response.

- o. With respect to past activities or operations at each Subject Property, provide copies of any stormwater or drainage studies, including data from sampling, conducted at the Subject Property. Also provide copies of any Stormwater Pollution Prevention or Maintenance Plans or Spill Plans that may have been developed for different operations during Respondent's occupation of the Subject Property.

The City has no stormwater reports, drainage studies or spill plans related to the substations discussed in this response. Equipment sampling data has been produced.

- p. Describe each underground storage tank present at any time on a Subject Property, including but not limited to the size and location of the tank, the materials stored in the tank, the time period of use, whether any material leaked from the tank, the type and quantity of leaked material, and the response to the leaked material.

No underground storage tanks are associated with commercial substations.

- q. Provide the names and last known address of any tenants or lessees, the dates of their tenancy and a description of the activities or operations they conducted while present at the Subject Property.

No tenants or lessees are associated with commercial substations.

- r. If Respondent, its parent corporation, subsidiaries or other related or associated companies have filed for bankruptcy, provide:
 - i. the U.S. Bankruptcy Court in which the petition was filed;
 - ii. the docket numbers of such petition;
 - iii. the date the bankruptcy petition was filed;
 - iv. whether the petition is under Chapter 7 (liquidation), Chapter 11 (reorganization), or other provision; and
 - v. a description of the current status of the petition.

The Respondent, City of Seattle, has not filed for Bankruptcy.

- s. If not already provided, identify and provide a last known address or phone number for all persons, including Respondent's current and former employees or agents, other than attorneys, who have knowledge or information about the generation, use,

⁴⁵ Pers. Comm. w/L. Hammack and M. Juntilla, 3/1/2016.

purchase, storage, disposal, placement, or other handling of hazardous substances, pollutants, or contaminants, or transportation of hazardous substances, pollutants, or contaminants to or from, the Subject Property.

[Echo Tremaglio](#)
Senior Environmental Analyst
Seattle City Light
206-684-3550

EWOU Commercial Substations - Power Systems Information

Report Year	Substation	Address	Equipment Nameplate, Capacity and Type (see glossary below)	Source of Information
1956	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	4 mva Special Penn	SEA713195, at SEA713202 (8-11) 1956 Power System Information report
1960	Boeing Yard A	2400 11th Avenue SW	6.25 mva Special	SEA EWW_00008676, at SEA EWW_00008710 (35-39)
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	
	Puget Sound Bridge & Dredge	2929 16th Avenue SW	3 mva Special	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	
1962	Boeing Yard A	2400 11th Avenue SW	6.25 mva Special	SEA713207, at SEA713234 (28-36) 1962 Power System Information report
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Puget Sound Bridge & Dredge	2929 16th Avenue SW	3 mva Special	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1964	Boeing Yard A	2400 11th Avenue SW	6.25 mva Special	SEA EWW_00008723, at SEA EWW_00008773 (51-57)
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	
	Lone Star Cement	3801 E. Marginal Way S	3 mva Packard	
	Puget Sound Bridge & Dredge	2929 16th Avenue SW	3 mva Special	

EWOU Commercial Substations - Power Systems Information

	Todds Shipyards	1801 16th Avenue SW	3 mva Mol	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1965	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	SEA EWW_00008852, at SEA EWW_00008914 (63-70)
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Puget Sound Bridge & Dredge	2929 16th Avenue SW	3 mva Special 7.5 mva G.E.	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1966	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	SEA EWW_00008943, at SEA EWW_00008943_0062 (63-67) 1966 Power System Information report
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1968	Boeing Yard A	2400 11th Avenue SW	6 mva Special	SEA EWW_00009666, at SEA EWW_00009734 (69-73)
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	

EWOU Commercial Substations - Power Systems Information

	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1969	Boeing Yard A	2400 11th Avenue SW	6 mva Special	SEA EWW_00008945, at SEA EWW_00009013 (69-73)
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	3 mva Special Penn	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards	1801 16th Avenue SW	3 mva Mol	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1971	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	5 mva Special Penn	SEA713490, at SEA713535 (46-50) 1971 Power System Information report
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1973	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	5 mva Special	SEA EWW_00009766, at SEA EWW_00009812 (47-51)
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	

EWOU Commercial Substations - Power Systems Information

	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2. 5 mva Central	
1978	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	5 mva Special	SEA EWW_00008944, at SEA EWW_0008944_0082 (83-86)
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1982	Burlington Northern	3rd S & S Holgate	3 mva unit Allis	SEA713673, at SEA713728 (56-59) 1982 Power System Information report
	Cudahy Foods	2203 Airport Way S	3 mva unit G.E.	
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	7.5 mva FPE	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Lone Star Cement	3801 E Marginal Way S	3 mva Packard	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1985	Ash Grove Cement	3801 E Marginal Way S	3 mva Packard	SEA713741, at SEA713802 (62-65) 1985 Power System Information report

EWOU Commercial Substations - Power Systems Information

	Burlington Northern	3rd S & S Holgate	3 mva unit Allis	
	Cudahy Foods	2203 Airport Way S	3 mva unit G.E.	
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	7.5 mva FPE	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1990	Ash Grove Cement	3801 E Marginal Way S	3 mva Packard	SEA713876, at SEA713930 (55-58) 1990 Power System Information report
	Burlington Northern	3rd S & S Holgate	3 mva unit Allis	
	Cudahy Foods	2203 Airport Way S	3 mva unit G.E.	
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	7.5 mva FPE	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
1998	Ash Grove Cement	3801 E Marginal Way S	3 mva Packard	SEA713812, at SEA713864 (53-56) 1998 Power System Information report
	Burlington Northern	3rd S & S Holgate	3 mva unit Allis	

EWOU Commercial Substations - Power Systems Information

	Cudahy Foods	2203 Airport Way S	3 mva unit G.E.	
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	7.5 mva FPE	
	Lockheed Corp - Plant 1	2929 16th Avenue SW	5 mva FPE	
	Todd Shipyards - South Yard	1801 16th Avenue SW	3 mva Mol	
	Todd Shipyards - North Yard	1801 16th Avenue SW	2 mva Kuhlman	
	Western Steel Casting	145 S Horton Street	2.5 mva Central	
2004	Ash Grove Cement	3801 E Marginal Way S	1-7.5 mva Packard 1-10 mva	SEA EWW_00009037, at SEA EWW_00009132 (96-98)
	Burlington Northern	3rd S & S Holgate	3 mva unit Allis	
	Fisher Flour Mill	approximately 16th Avenue SW and SW Lander Street	7.5 mva FPE	
	Port of Seattle T-18	1050 SW Spokane Street	2-7.5 mva	

Glossary:

- MVA - megavoltampere (1,000 kVA or 1,000,000 VA)
- Penn - Pennsylvania Transformer (a division of McGraw Edison Co.)
- Allis - Allis-Chalmers
- D.E. - Double ended (unit substation with transformers on each end of bus)
- GE - General Electric
- Mol - Moloney Electric Co.
- FPE - Federal Pacific Electric